STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

CODY POLE

ROAD PLAN

SECTION 30, 31, TOWNSHIP 17 NORTH, RANGE 03 WEST, W.M.
SECTION 36, TOWNSHIP 17 NORTH, RANGE 04 WEST, W.M.
SECTION 36, TOWNSHIP 18 NORTH, RANGE 03 WEST, W.M.
THURSTON COUNTY

BLACK HILLS DISTRICT

AGREEMENT NO.: 30-075753

CONTRACT ADMINISTRATOR: Koshare Lomnicki

DATE: 03/01/2004

STAFF ENGINEER: Cameron Rittich

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition and application of rock;
acquisition and application of asphalt concrete pavement;
road deactivation;
grass seeding.

This project also includes but is not limited to reconstruction and optional reconstruction including:

cleaning ditches;
extending existing culverts;
acquisition and installation of additional drainage structures;
widening road segments;
grading and shaping existing road surface and turnouts;
compaction of road surface;
acquisition and application of rock;
acquisition and application of asphalt concrete pavement;
road deactivation;
grass seeding.

This project also includes but is not limited to pre-haul maintenance including:

cleaning ditches;
grading and shaping existing road surface and turnouts;
compaction of road surface.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, or pre-haul maintenance including landings unless otherwise noted.

1.1-2

Construction, reconstruction, or pre-haul maintenance of the following roads is required. All roads shall be constructed, reconstructed, or pre-haul maintained on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Spur 1A	0+00 to 1+00	Construction
Spur 3A	0+00 to 1+00	Reconstruction
Spur 7A	0+00 to 1+73	Pre-haul maintenance
	1+73 to 8+17	Construction
D-4050	0+00 to 3+63	Pre-haul maintenance

1.1-3

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Spur 1A	1+00 to 10+60	Construction
Spur 3A	1+00 to 2+73	Reconstruction
Spur 4A	0+00 to 1+00	Construction
Spur 4B	0+00 to 1+00	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-6

Purchaser shall be responsible for obtaining a Thurston County Approach Permit. All materials and work associated with this permit shall be provided by the Purchaser.

1.2-1

The construction, reconstruction, or pre-haul maintenance of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed, reconstructed, or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to subgrade compaction, and/or timber haul.

1.3-2

Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.2.1-1

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-3

Right-of-way debris shall not be placed against standing timber.

4.2.3-4

Right-of-way debris shall be scattered outside the grubbing limits.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-1B

On the following road, the existing subgrade shall be widened to the dimensions shown on the TYPICAL SECTION SHEET.

Road	Stations
Spur 3A	0+00 to 1+00

5.1-3

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 10 percent favorable and 10 percent adverse. Minimum radius curve is 100 feet.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-8.1

On the following roads, Purchaser shall pull ditches before the shaping and compaction of the existing road surface.

Road	Stations
Spur 3A	0+00 to 2+73
Spur 7A	0+00 to 1+73
D-4050	0+00 to 3+63

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11
Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12
Organic material shall be excluded from embankment.

5.1-18
Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.1.1-1
Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-3
Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.3-1
All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1
Silt-bearing runoff shall not be permitted to go into streams.

5.4-2
Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1
On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:
1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

Road	Stations	Seed Quantity (lbs)
Spur 1A	0+00 to 10+60	35
Spur 3A	0+00 to 2+73	10
Spur 4A	0+00 to 1+00	5
Spur 4B	0+00 to 1+00	5
Spur 7A	1+73 to 8+17	20

5.5-4

Constructed, reconstructed, or pre-haul maintained subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2

Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-3

On all reconstructed roads, the construction and reshaping of ditches, and the cleaning of inlets and outlets of culverts shall be completed prior to the application of rock and shall be done in accordance with the TYPICAL SECTION SHEET and CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1

Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. A copy of the written plan is available upon request from the Pacific Cascade Region office. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

Source	Location
Waddell Triangle Pit	SW ¼ Sec. 21, T17N, R03W, W.M.

7.1-4

Rock for construction and/or reconstruction of roads under this contract may be obtained from existing stockpiles on State land as listed below at no charge to the Purchaser. Purchaser shall remove no more than 641 cubic yards of 3 INCH MINUS CRUSHED rock and no more than 79 cubic yards of 1 INCH MINUS CRUSHED rock. Additional rock may be purchased at a cost of $8.00 per cubic yard subject to written approval of the Contract Administrator.

Source	Location
Greenline Quarry Stockpile	NW ¼ Sec. 29, T17N, R03W, W.M.
Waddell Basalt Quarry Stockpile	SE ¼ Sec. 21, T17N, R03W, W.M.

7.2.1-4

Rock shall meet the following specifications for gradation when placed in hauling vehicles. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

7.2.1.1-10

8 INCH PLUS ROCK

% equal to, or larger in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.2-2

Pit run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.3-1

Measurement of the rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-1.1

On the following road, Purchaser shall apply 1½ INCH MINUS CRUSHED rock on the road shoulder. Rock shall be applied, shaped, and compacted to insure a smooth transition from the bituminous surface treatment to the shoulder of the road.

Road	Stations
Spur 1A	0+00 to 0+25
Spur 3A	0+00 to 0+20
Spur 4A	0+00 to 0+20
Spur 4B	0+00 to 0+25

7.4.2-4

On the following roads, if hauling shall take place only from May 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

Road	Stations
Spur 1A	1+00 to 10+60
Spur 3A	1+00 to 2+73
D-4050	Landing @ 3+63

7.4.2-9

Turnarounds and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-2

Rock shall be spread and compacted full width in lifts each not to exceed 15 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

7.5-1.5

On the following roads, ASPHALT CONCRETE CLASS "A" shall be applied to a depth of 2" in one lift. The minimum road width paved shall be as shown on the INTERSECTION DETAIL.

Application of the ASPHALT CONCRETE CLASS "A" shall conform with all requirements of the Washington State Department of Transportation "2002 Standard Specifications for Road, Bridge, and Municipal Construction."

All damaged asphalt resulting from construction shall be replaced in one contiguous mat. Edges will be cut with a saw, perpendicular to the traveled way, and a tack coat of emulsified asphalt applied.

The Purchaser shall suspend operations when, in the opinion of the Contract Administrator, weather is such that satisfactory results cannot be obtained.

Road	Stations
Spur 1A	0+00 to 0+25
Spur 3A	0+00 to 0+20
Spur 4A	0+00 to 0+20
Spur 4B	0+00 to 0+25

SECTION 8 - STRUCTURES

8.2-1

The following road intersections shall be constructed to include additional subgrade flare as shown in the INTERSECTION DETAIL. The intersections shall also conform to the Road Approach Agreement entered into by the Purchaser and Thurston County.

Road	Stations
Spur 1A	0+00 to 0+25
Spur 3A	0+00 to 0+20
Spur 4A	0+00 to 0+20
Spur 4B	0+00 to 0+25

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.1-1

The following roads shall be deactivated by the Purchaser at the termination of use.

Road	Stations
Spur 1A	0+00 to 0+20
Spur 3A	0+00 to 0+20
Spur 4A	0+00 to 0+20
Spur 4B	0+00 to 0+20

9.1-2

Deactivation shall consist of:

blocking access with 40 cubic yards of stumps at each location as directed by the Contract Administrator.

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

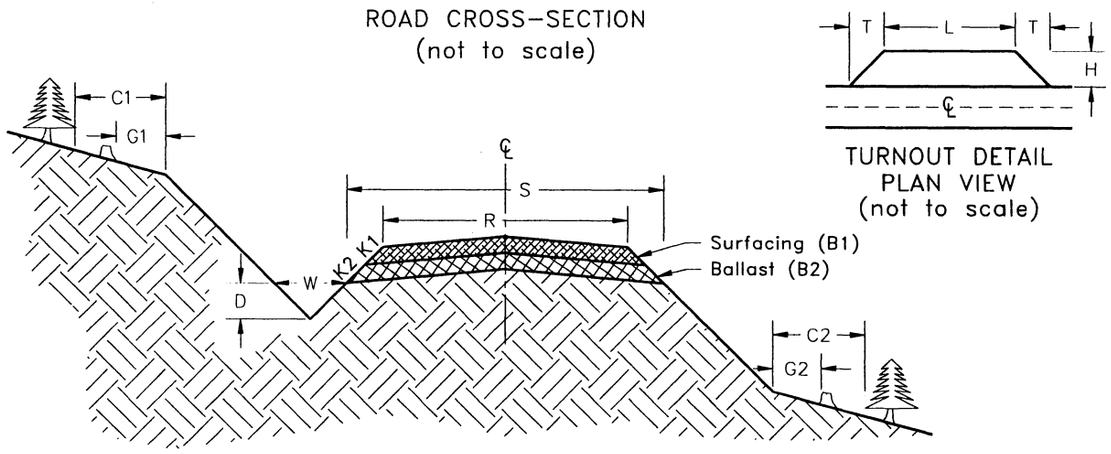
9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

Landing embankments shall be sloped to original construction specifications.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
Spur 1A	0+00	1+00	C	18.5'	15'	3'	1'	4"	5'	5'	10'	10'
	1+00	10+60	C	15'	12'	3'	1'	4"	5'	5'	10'	10'
Spur 3A	0+00	1+00	C	18.5'	15'	3'	1'	4"	-	-	10'	10'
	1+00	2+73	C	15'	12'	3'	1'	4"	-	-	10'	10'
Spur 4A	0+00	1+00	C	18.5'	15'	3'	1'	4"	3'	3'	5'	5'
Spur 4B	0+00	1+00	C	18.5'	15'	3'	1'	4"	3'	3'	5'	5'
Spur 7A	0+00	1+73	C	-	12'	3'	1'	4"	-	-	-	-
	1+73	8+17	C	15'	12'	3'	1'	4"	5'	5'	10'	10'
D-4050	0+00	3+63	C	-	-	3'	1'	4"	-	-	-	-

ROCK LIST
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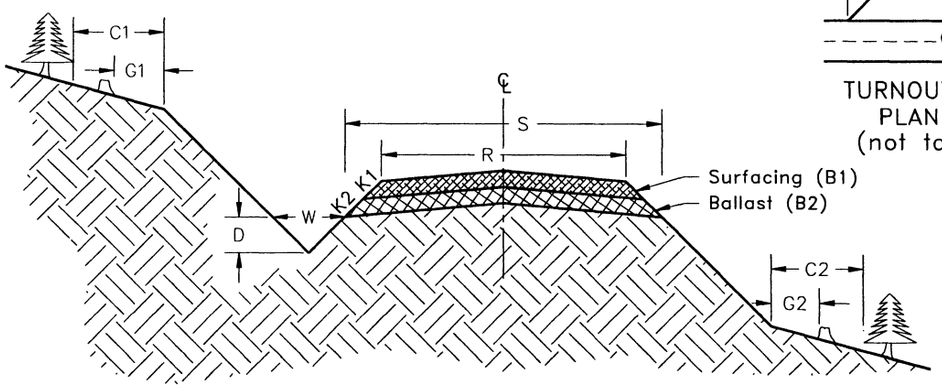
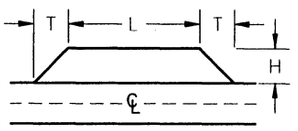
ROAD CROSS-SECTION
(not to scale)





TURNOUT DETAIL
PLAN VIEW
(not to scale)

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
					PIT RUN			Waddell Triangle Pit or Greenline Quarry			
Spur 1A	1+00	10+60	2:1	10"	53	9.60	509				
Spur 3A	1+00	2+73	2:1	10"	53	1.73	92				
*D-4050	Landing (1)				-	-	50				
*	Landings (4)				-	-	200				
					3 INCH MINUS CRUSHED			Waddell Basalt Quarry Stockpile			
Spur 1A	0+00	0+25	1 ½:1	10"	67	0.25	17				
	Curve widening				-	-	22				
	0+25	1+00	1 ½:1	12"	77	0.75	58				
Spur 3A	0+00	0+20	1 ½:1	10"	67	0.20	13				
	Curve widening				-	-	11				
	0+20	1+00	1 ½:1	12"	77	0.80	62				
Spur 4A	0+00	0+20	1 ½:1	10"	67	0.20	13				
	Curve widening				-	-	13				
	0+20	1+00	1 ½:1	12"	77	0.80	62				
Spur 4B	0+00	0+25	1 ½:1	10"	67	0.25	17				
	Curve widening				-	-	18				
Spur 7A	1+73	8+17	1 ½:1	10"	52	6.44	335	Greenline Quarry Stockpile			
					8 INCH PLUS			Waddell Triangle Pit or Greenline Quarry			
Culvert headwalls & energy dissipators				-	-	-	6				

*Optional Rock: If Purchaser elects to haul on optional rock roads in dry weather, the depth listed above is recommended but not required.

PIT RUN TOTAL 851 Cubic Yards
3 INCH MINUS CRUSHED TOTAL 306 Cubic Yards
(Waddell Basalt Stockpile)
3 INCH MINUS CRUSHED TOTAL 335 Cubic Yards
(Greenline Stockpile)
8 INCH PLUS TOTAL 6 Cubic Yards

ROCK LIST

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
					1 INCH MINUS CRUSHED			Waddell Basalt Quarry Stockpile
Spur 1A	0+00	0+25	1 ½:1	2"	12	0.25	3	
	Curve widening				-	-	4	
Spur 3A	0+00	0+25	1 ½:1	2"	12	0.20	3	
	Curve widening				-	-	2	
Spur 4A	0+00	0+20	1 ½:1	2"	12	0.20	3	
	Curve widening				-	-	3	
Spur 4B	0+00	0+25	1 ½:1	2"	12	0.25	3	
	Curve widening				-	-	3	
Culvert backfill							55	
					ASPHALT CONCRETE CLASS 'A'			Commercial Source
Spur 1A	0+00	0+25	1 ½:1	2"	12	0.25	3	
	Curve widening				-	-	4	
Spur 3A	0+00	0+20	1 ½:1	2"	12	0.20	3	
	Curve widening				-	-	2	
Spur 4A	0+00	0+20	1 ½:1	2"	12	0.20	3	
	Curve widening				-	-	3	
Spur 4B	0+00	0+25	1 ½:1	2"	12	0.25	3	
	Curve widening				-	-	3	

Application of Asphalt Concrete Class 'A' shall be in accordance to the INTERSECTIN DETAIL.

1 INCH MINUS CRUSHED TOTAL 79 Cubic Yards
ASPHALT CONCRETE CLASS 'A' TOTAL 24 Cubic Yards

CODY POLE
ROAD PLAN MAP
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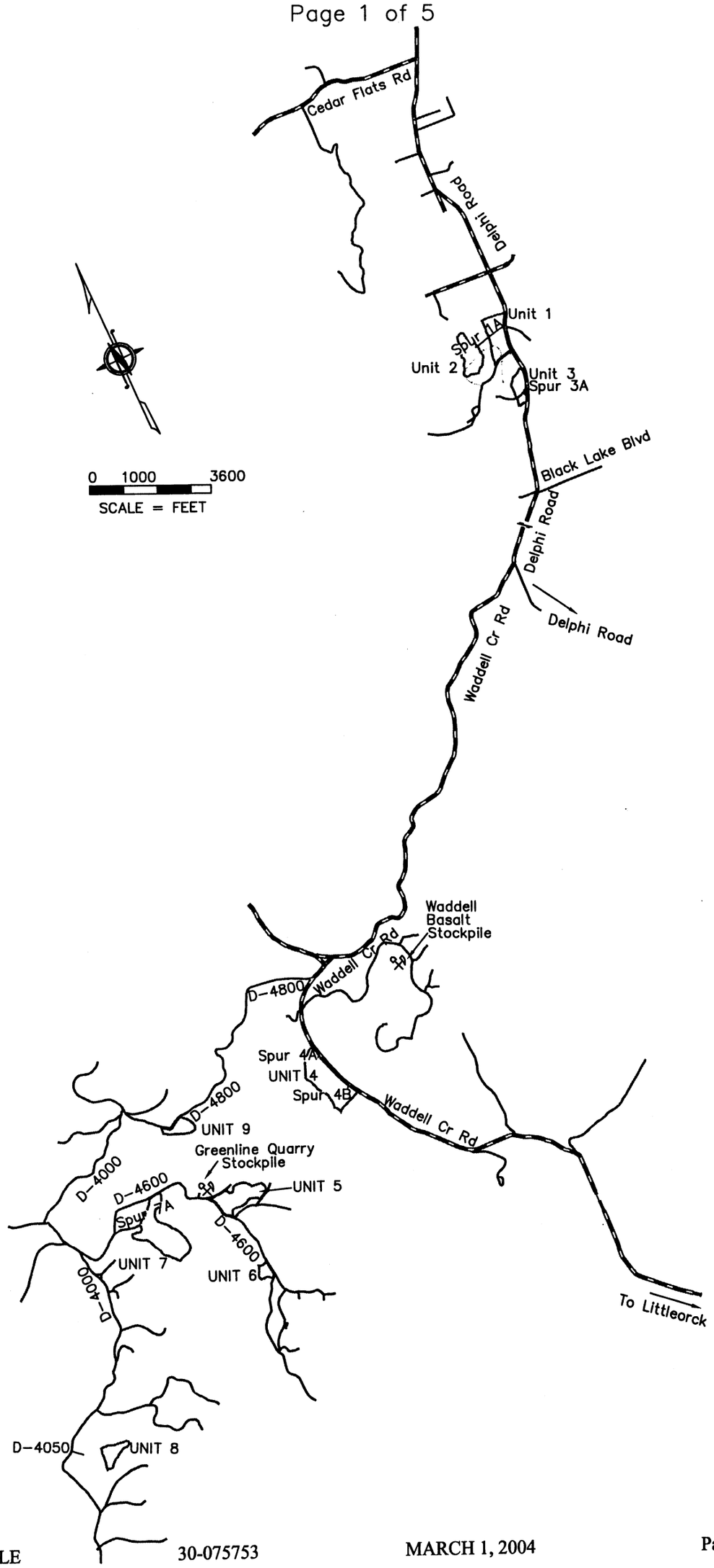

CODY POLE

ROAD PLAN MAP

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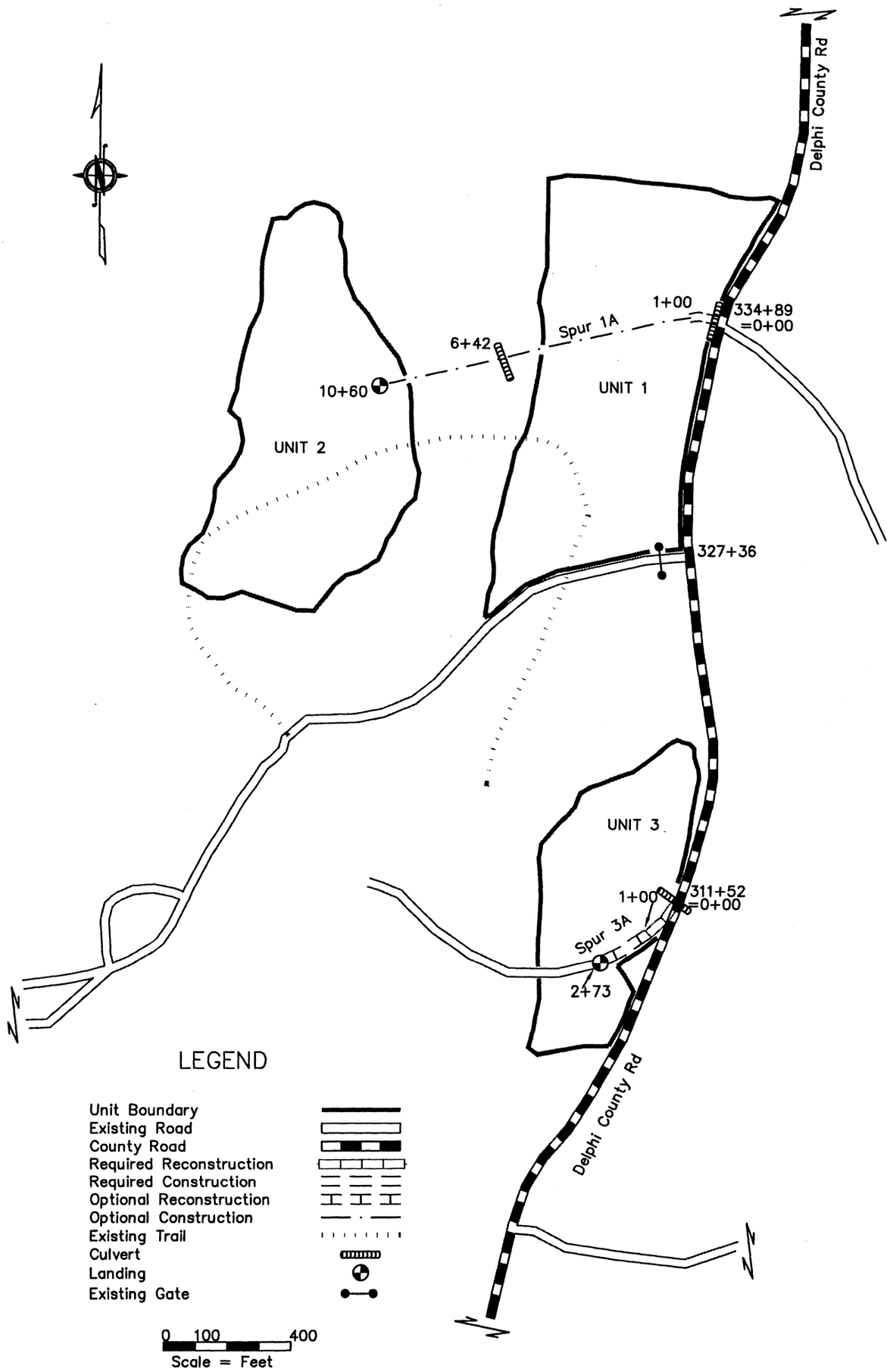

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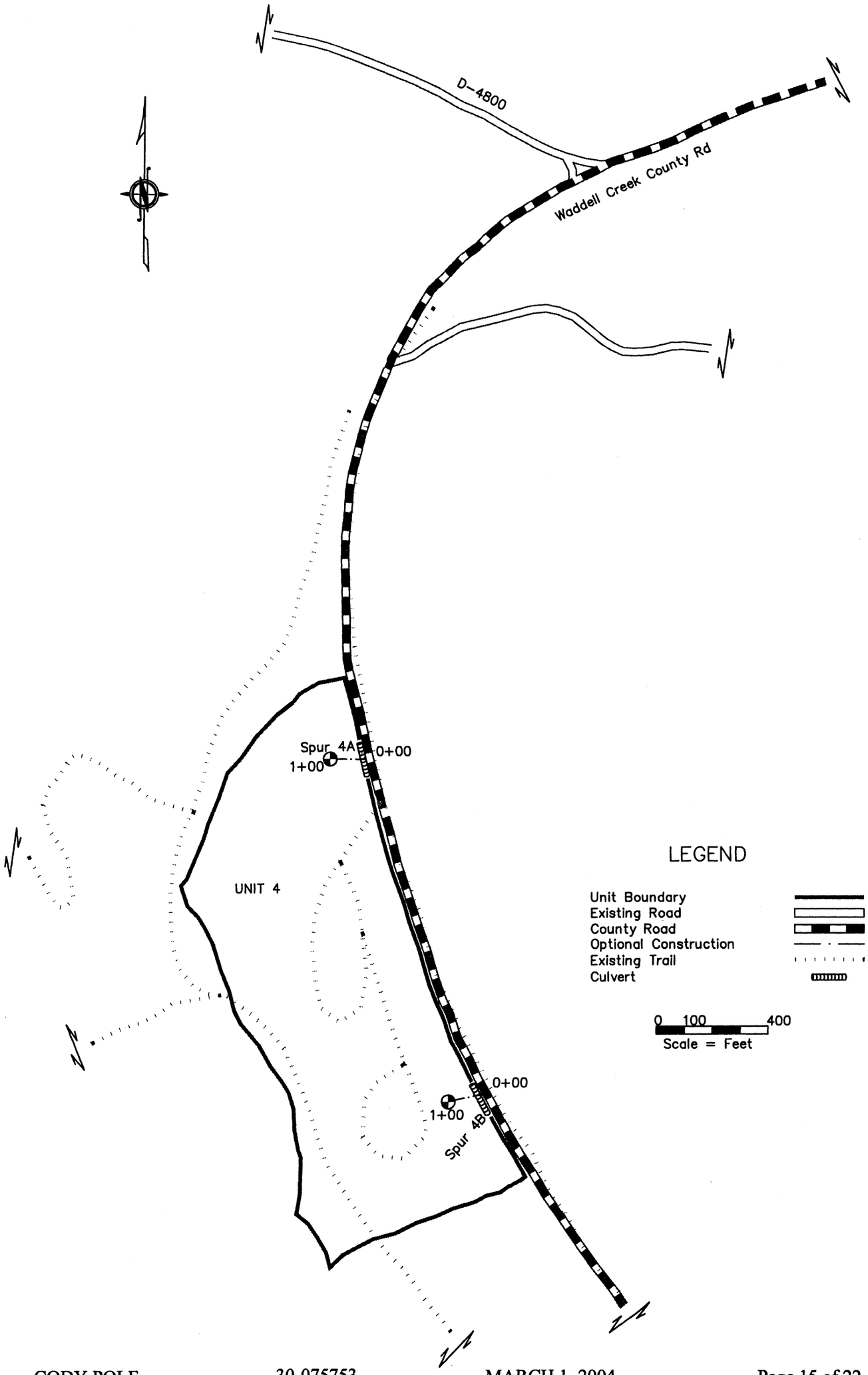

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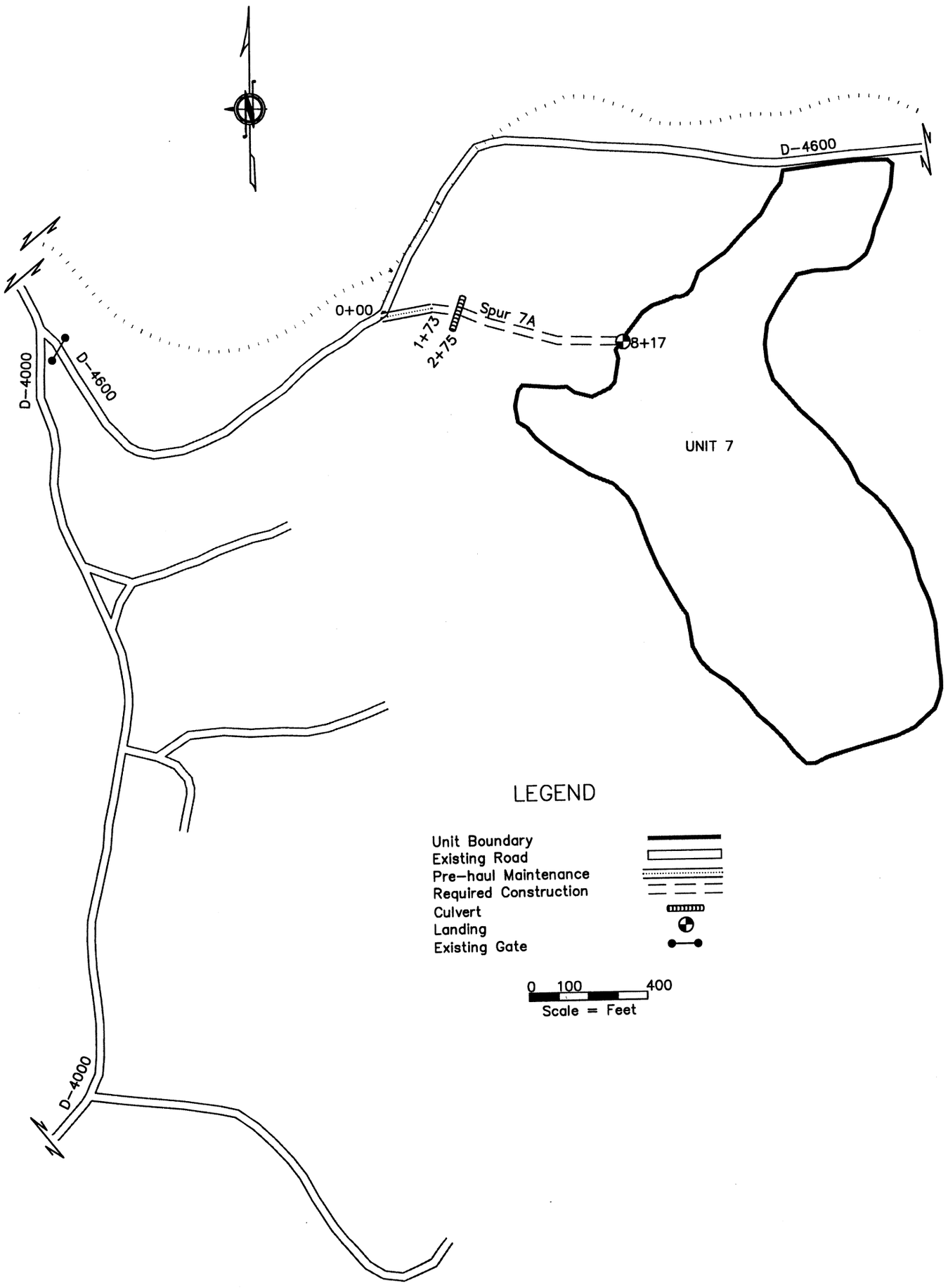

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ROAD PLAN MAP

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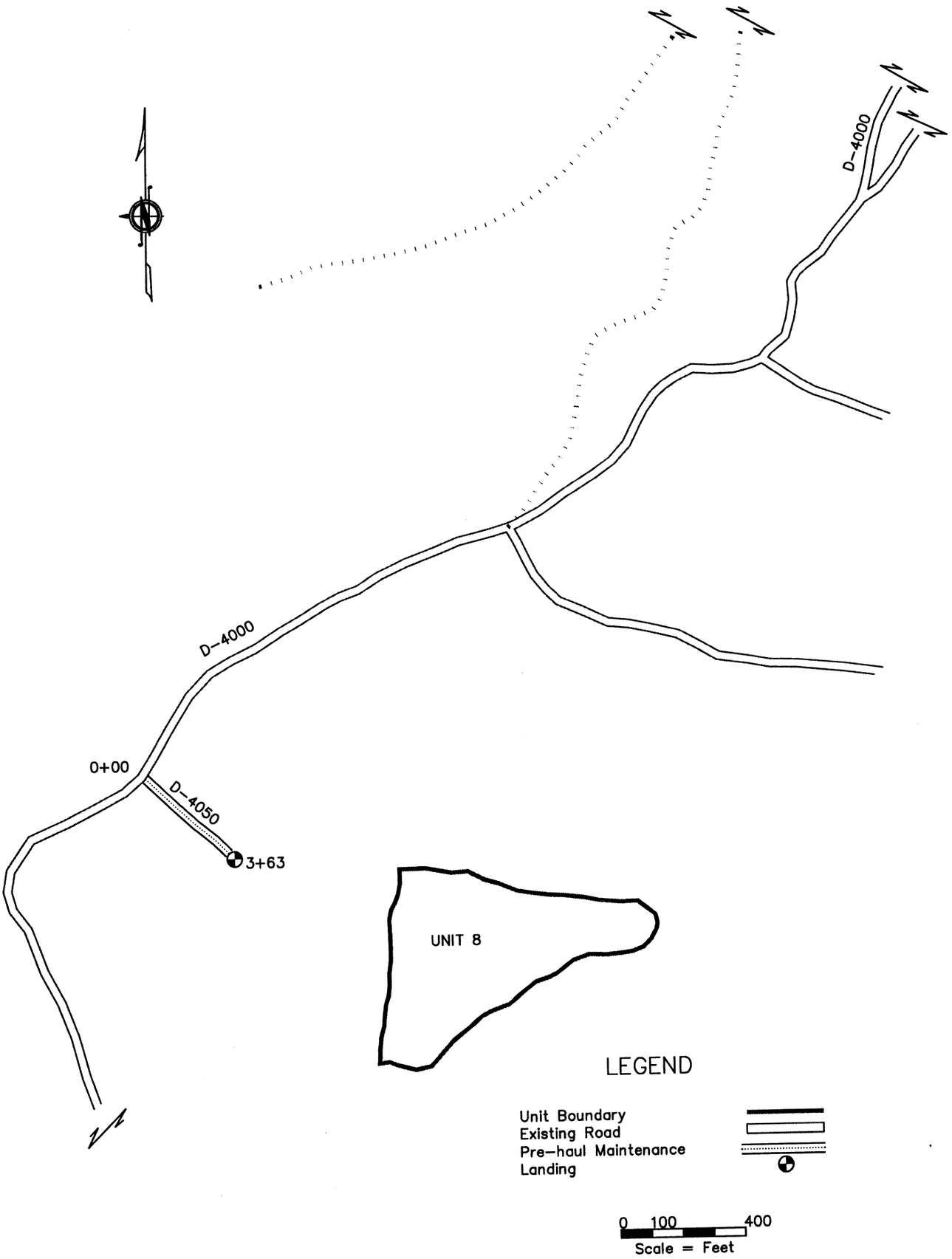
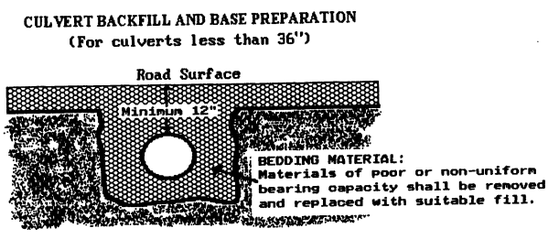


CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Quantity (c.y.)	Const. Staked	Remarks
			If Steel										
Spur 1A	0+00	12"	-	60	-	-	½	½	8"	1"	15	-	*Bevel ends
	6+42	18"	-	30	-	-	½	½	8"	NT	-	-	
Spur 3A	0+00	18"	-	30	-	-	½	½	8"	1"	10	-	Extension to existing pipe. *Bevel ends
Spur 4A	0+00	12"	-	60	-	-	½	½	8"	1"	15	-	*Bevel ends
Spur 4B	0+00	12"	-	60	-	-	½	½	8"	1"	15	-	*Bevel ends
Spur 7A	2+75	18"	-	32	-	-	½	½	8"	NT	-	-	

*NOTE: Bevel ends in accordance with Thurston County Road Approach Permit

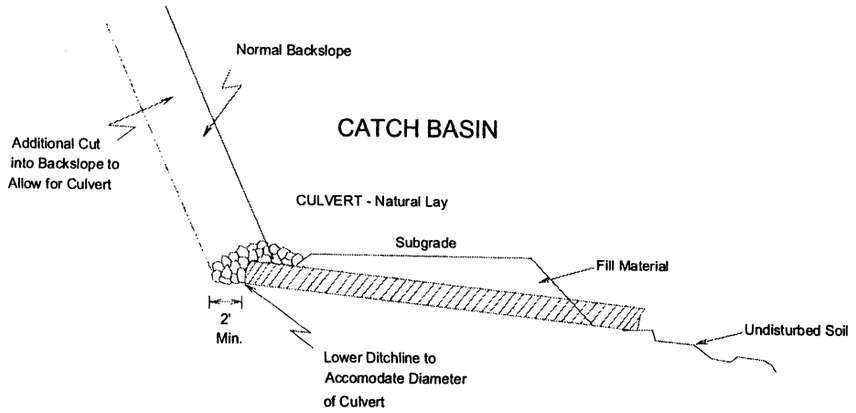


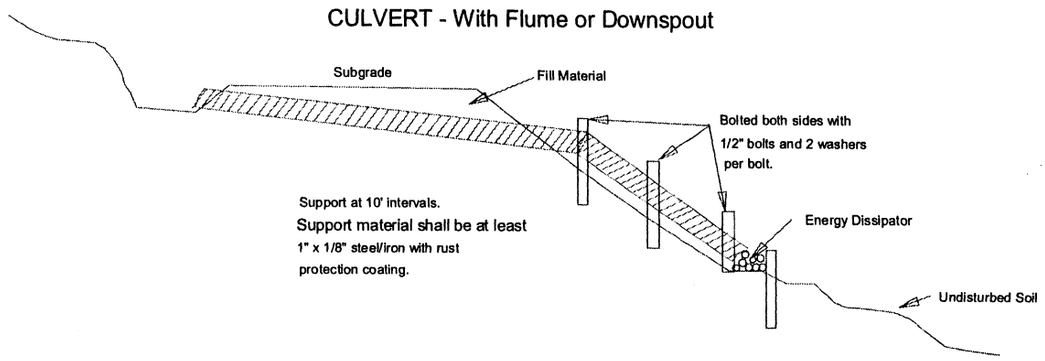
Key:

8" - 8 Inch Plus Rock
1" - 1 Inch Minus Crushed Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

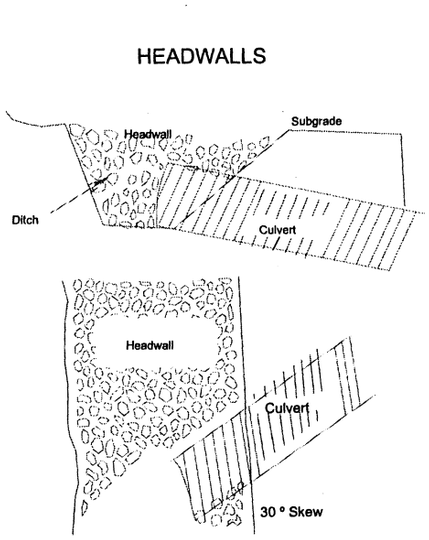
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)

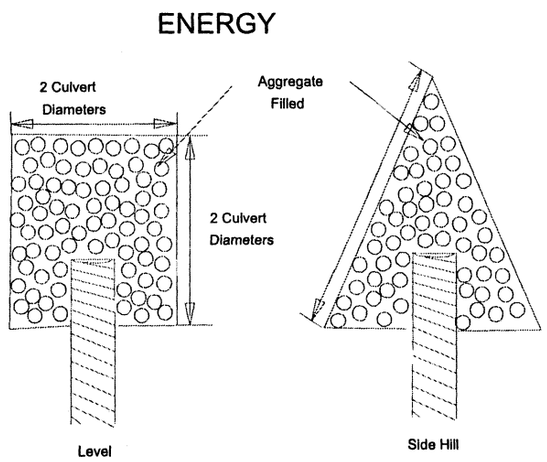




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

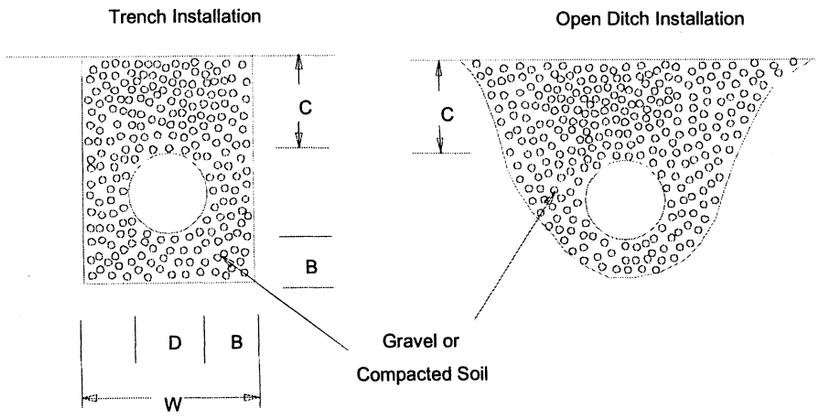
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1½:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

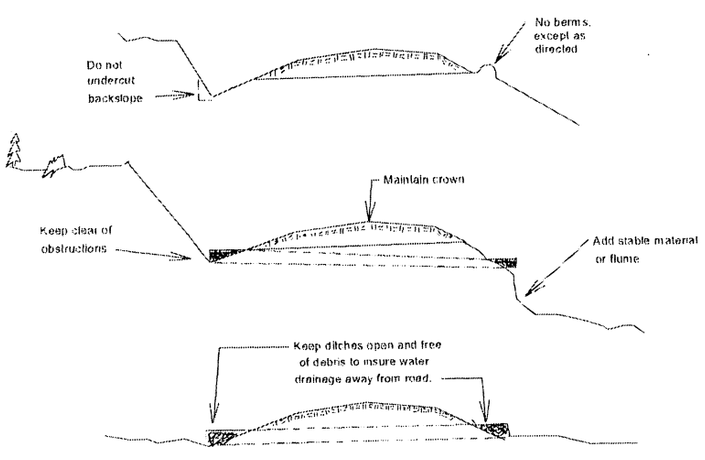
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

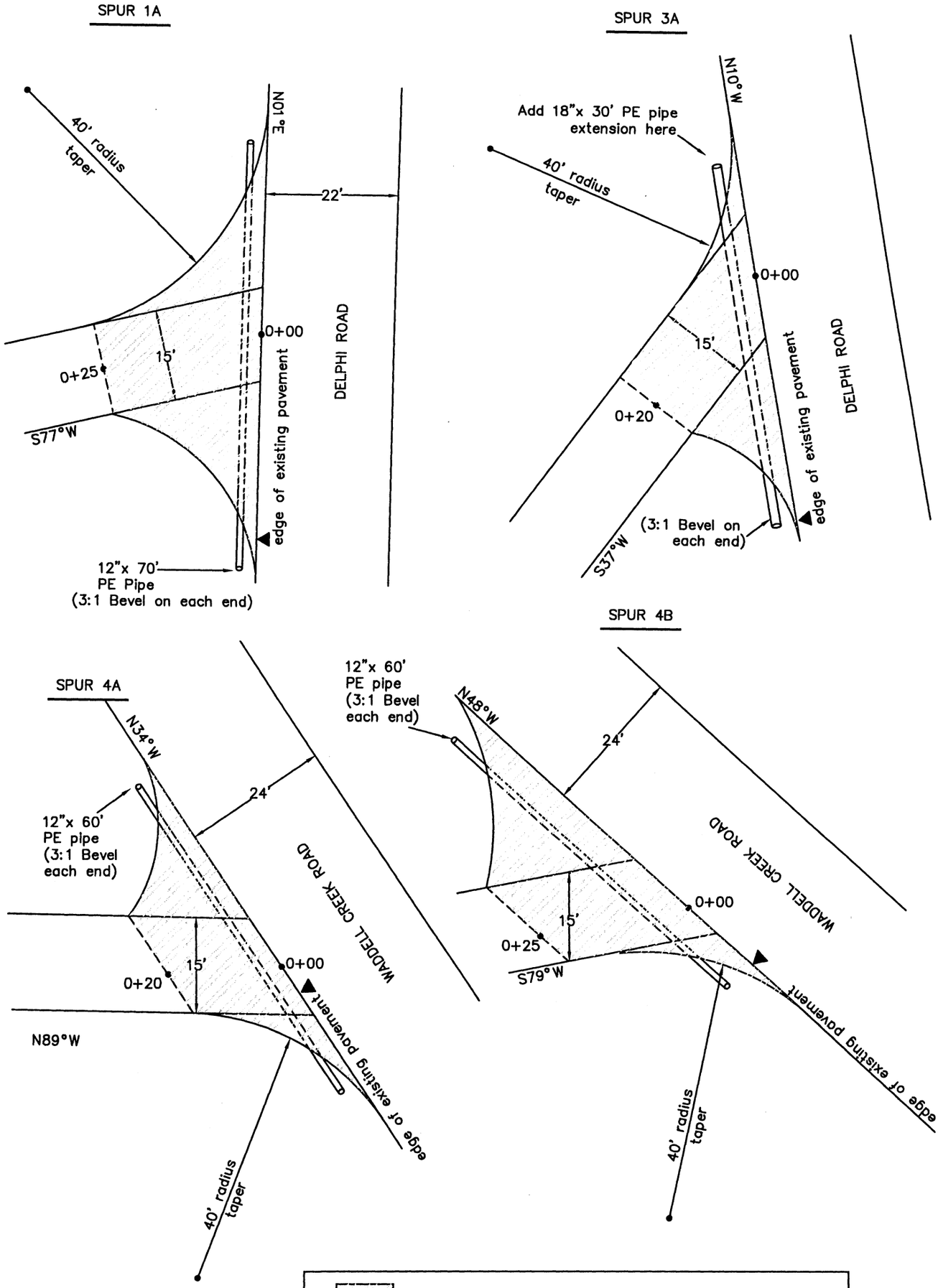
D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.



INTERSECTION DETAIL



Asphalt Concrete Class 'A' Pavement

Road	Road (s.f.)	Curve Widening (s.f.)	Total (s.f.)
Spur 1A	375	485	860
Spur 3A	300	250	550
Spur 4A	300	299	599
Spur 4B	375	394	769
			2,228

NOTE: Scale 1"=20'
Declination = 0 degrees

DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

FORM 9-87(Rev. 12-02)

SUMMARY - Road Development Costs

DISTRICT: Black Hills

SALE/PROJECT NAME: Cody Pole CONTRACT NUMBER: N/A

LEGAL DESCRIPTION: Section 36 of T17-4 and T18-3, and Section 30,31 of T17-3

ROAD NUMBER:	Spur 1A, 3A, 4A and 4B	Spur 1A, 3A, and 7A	Spur 7A and D-4050
ROAD STANDARD:	County Access (15' R.S.)	Secondary Mainline (12' R.S.)	Spur(12' R.S.) - PHM & landings
NUMBER OF STATIONS:	4.00	17.77	5.36
SIDESLOPE:	0-10%	10-20%	10-25%
CLEARING AND GRUBBING:	$983	$3,027	$380
EXCAVATION AND FILL:	$422	$3,894	$172
ROCK TOTALS (Cu. Yds.):			
Ballast: 1156	$1,591	$5,149	$0
Surface: 329	$411	$0	$783
PAVING: 24	$6,000	$0	$0
CULVERTS AND FLUMES:	$2,518	$747	$0
DEACTIVATION:	$800	$0	$0
GENERAL EXPENSES:	$1,273	$1,282	$160
MOBILIZATION:	$650	$650	$650
TOTAL COSTS:	$14,648	$14,747	$2,144
COST PER STATION:	$3,662	$830	$400

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $31,540

SALE VOLUME MBF = 2,485

TOTAL COST PER MBF = $12.69

Plans to be furnished by:

Plan only: STATE

Plan-profile:

Compiled by: C. Rittich Date: 04/18/04

Checked by: _____ Date: _____

Region Engineer: _____ Date: _____

Div of Engr.: _____ Date: _____

REMARKS: _____

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Cody Pole

CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur 1A, 3A, 4A and 4B	10%	30	1.00	2.56	$80	1.20	4.00	$983

Clear and Grub TOTAL = $983

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur 1A, 3A, 4A and 4B	10%	1.00	1.00	$88	1.20	4.00	$422

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				
Large Fills/ Cuts				

Excavation TOTAL = $422

III. BALLAST AND SURFACING :

Ballast source: Waddell Basalt Stockpile
Surface source: Waddell Basalt Stockpile
Riprap source : Waddell Basalt Stockpile

Description	cu.yds/sta	x stations	= cubic yards
Ballast (3"-)	77	4.00	306
Surfacing (1"-)	79	1.00	79

Surfacing is for culvert backfills

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot	$0.00	$0.00	
Dig and load	$1.00	$1.00	
Crushing	$0.00	$0.00	
Purchase			
Haul *	$2.95	$2.95	$2.95
Spread	$0.80	$0.80	
Compact	$0.45	$0.45	
Strip			
Reclamation			
TOTAL ($/cy)	$5.20	$5.20	$2.95

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	12.0
Ave. Speed =	40
Delay (Hrs.)=	0.2
Cost / Hour =	$65.00
CY / Load =	11

Ballast (3"-)	306	Cu. yds @	$5.20 /cu. yd =	$1,591
Surfacing (1"-)	79	Cu. yds @	$5.20 /cu. yd =	$411
PAVING				$6,000

Rock total = $8,002

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
12" & 18" PE pipe	1	N/A	18"	210	$11.80	$2,478
Bands & Gaskets	(4)					$40

Culvert total = $2,518

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
	DEACTIVATION				$800
					$0
					$0

Structure total = $800

Sub-TOTAL = $12,725

VI. GENERAL EXPENSES: Overhead & General Exp. Add 10% $1,273

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400		$0
Front end loader	400	1	$400
Rock crusher	$1,500		$0
Dozer (D5)		1	$0

Total Mobilization = $1,950 Mobilization sub-total = $650

Road No. Spur 1A, 3A, 4A and 4B
Standard: County Access (15' R.S.)
Stations: 4.00

SHEET TOTAL = $14,648

By: C. Rittich

Date: 04/18/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Cody Pole

CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur 1A, 3A, and 7A	10%	30	1.00	2.85	$60	1.00	17.70	$3,027

Clear and Grub TOTAL = $3,027

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur 1A, 3A, and 7A	10%	1.00	2.50	$88	1.00	17.70	$3,894

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				
Large Fills/ Cuts				

Excavation TOTAL = $3,894

III. BALLAST AND SURFACING :

Ballast source: Waddell Triangle or Greenline Pitrun
Surface source:
Riprap source :

Description	cu.yds/sta	x stations	= cubic yards
Ballast (Pit Run)	48	17.70	850
Surfacing (2 1/2"-)			0
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot			
Dig and load	$1.00	$1.00	
Crushing			
Purchase			
Haul *	$3.81	$3.81	$3.81
Spread	$0.80	$0.80	
Compact	$0.45	$0.45	
Strip			
Reclamation			
TOTAL ($/cy)	$6.06	$6.06	$3.81

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	20.0					
Avc. Speed =	45	Ballast (Pit Run)	850	Cu. yds @	$6.06 /cu. yd =	$5,149
Delay (Hrs.)=	0.2	Surfacing (2 1/2'	0	Cu. yds @	$6.06 /cu. yd =	$0
Cost / Hour =	$65.00	Riprap	0	Cu. yds @	$3.81 /cu. yd =	$0
CY / Load =	11					

Rock total = $5,149

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	1	na	18	62	$11.80	$732
Bands & Gaskets						$15

Culvert total = $747

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $12,816

VI. GENERAL EXPENSES: Overhead & General Exp. Add 10% $1,282

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	3	$300
Grader	$400	1	$400
Compactor	$400	1	$400
Excavator	$450	1	$450
Dozer D8)	$400		$0
Front end loader	$400	1	$400
Rock crusher	$1,500		$0
Dozer (D5)	$0	1	$0

Total Mobilization = $1,950 Mobilization sub-total = $650

Road No. Spur 1A, 3A, and 7A
Standard: Secondary Mainline (12' R.S.)
Stations: 17.70

SHEET TOTAL = $14,747

By: C. Rittich

Date: 04/18/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Cody Pole

CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur 7A and D-4050 (pre-haul maint &landing construction)	20%	30	1.00	2.77	$32	0.80	5.36	$380

Clear and Grub TOTAL = $380

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
(pre-haul maint &landing construction)	20%	1.00	2.00	$32	0.50	5.36	$172

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul	0	0	$0	$0
Large Fills/ Cuts	0	0	$0	$0

Excavation TOTAL = $172

III. BALLAST AND SURFACING :

Ballast source: Greenline Quarry pit run

Surface source:

Riprap source :

Description	cu.yds/sta x stations =	cubic yards
Pitrun		0
Pit run landings	0	250
Riprap		

UNIT COSTS	Ballast	Landings	Riprap
Drill & Shoot	$2.50		
Dig and load	$1.00	$1.00	
Crushing	$2.50		
Purchase			
Haul *	$2.13	$2.13	$2.13
Spread	$0.80		
Compact	$0.45		
Strip			
Reclamation			
TOTAL ($/cy)	$9.38	$3.13	$2.13

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	4.0					
Ave. Speed =	25	Pitrun	0	Cu. yds @	$9.38 /cu. yd =	$0
Delay (Hrs.)=	0.2	Pit run landings	250	Cu. yds @	$3.13 /cu. yd =	$783
Cost / Hour =	$65.00	Riprap	0	Cu. yds @	$2.13 /cu. yd =	$0
CY / Load =	11					

Rock total = $783

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
		na			$11.80	$0

Bands & Gaskets

Culvert total = $0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $1,334

VI. GENERAL EXPENSES: Overhead & General Exp. Add 12% $160

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	$300
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400	0	$0
Front end loader	400	1	$400
Rock crusher	$1,500	0	$0
Dozer (D5)	$0	1	$0

Total Mobilization = $1,950

Mobilization sub-total = $650

Road No. Spur 7A and D-4050

Standard: Spur(12' R.S.) - PHM & landings

Stations: 5.36

SHEET TOTAL = $2,144

By: C. Rittich

Date: 04/18/04